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Growth of *Saccharina* and *Palmaria* compared to chemical and physical parameters in the inner Danish waters

S.L. Holdt¹, U.S. Grandorf², I. Angelidaki¹, M.F. Pedersen²

¹Technical University of Denmark, Department of Engineering

²Roskilde University, The Department of Environmental, Social and Spatial Change

Email: suho@env.dtu.dk

Abstract

Algae as feedstock for high value-added products such as nutraceuticals and low value product such as energy are getting more attention in Denmark. Few macroalgal producers have initiated off shore cultivation of macroalgae, even though the high demand on cultivation ropes and algal biomass. Algal biomass (and the seeded cultivation ropes) is the bottle neck in algal research as well as business in Denmark. Furthermore, cultivation experiments are needed to investigate the suitability of the inner Danish water (with e.g. decreasing salinity, and different nutrient regimes) for macroalgal cultivation.

Macroalgae will be cultivated on ropes deployed at 6 locations in the sea more specifically Limfjorden in the North to further South in Horsens, Fredericia, Fåborg, Agersø and Bisserup in the Southern part of Denmark. Among other things, salinity and nutrient availability are important variables for the fitness and growth of macroalgae. The macroalgae will be deployed at 2 depths; 3 m and 6 m to see a possible effect of halocline (salinity stratification).

Growth data of weight, length and biomass composition (especially N, P, TS, VS) will be analyzed in different seasons. A modeling in the Geographical Information System ArcGIS on the obtained field data compared to the chemical and physical parameters (e.g. salinity (halocline), nutrient availability, currents, and cultivation areas for organic macroalgae). The macroalgal growth, biomass composition, the arcGIS, and the field samples on the variables will give a map of suitable areas for *S. latissima* and *P. palmata* cultivation in the inner Danish waters. The hypothesis is that the macroalgae perform better at higher salinities (further North and/or below the halocline) and in nutrient rich areas where light is not limited.